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ABSTRACT

Although research on creativity has had virtually no impact on higher education except in rare instances, the chances are good that this will change in the 1970s. Creativity research has had an increasingly greater effect on pre-primary, primary and secondary education, and more and more students are prepared to do such research when they enter college. Studies indicate, however, that the creative student can find few outlets in the university and has a higher dropout rate than the non-creative student. Traditional tests, admission policies, and the awarding of scholarships and fellowships are all geared to the conventional student and tend to discriminate against the creative student, often a member of a minority group. Students want to acquire creative problem-solving skills, and colleges and universities can no longer afford to ignore the needs of their creative, and, possibly, most productive students. (AF)

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CREATIVITY RESEARCH AND HIGHER EDUCATION[1]

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Creativity research has had virtually no impact on higher education -- except in rare, isolated instances! Higher education for the most part clings doggedly to the model of the medieval university. Most of the university buildings now under construction seem to have been designed to fit this model. Their barren, inflexible classrooms with seats firmly bolted to concrete floors and with a single desk and lectern almost defy creative teaching. Interaction methods, experimentation, role playing, creative problem solving, and other methods that make possible the integration of affective goals (emotions and feelings) and cognitive goals (intellectual learning) are almost impossible. Even provocative questions have a tough time in such settings.

The chances are good, however, that creativity research will have an impact on higher education in the 1970's. In many places throughout the world, there is much unrest in higher education. Many observers believe that we are witnessing the beginning of the destruction of higher education as we have known it. Some of these observers are saddened by this and feel that it will be the end of

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a Golden Age -- almost the end of civilization. Other observers herald the forthcoming change with great joy. They point to research which has indicated that students remain unchanged by their college experiences (Astin, 1969; Cass, 1969). They point to indications that man is using only a very small fraction of his potentialities -- perhaps less than five percent (Otto, 1969). They also point to the invention and testing of educational methods that increase immensely man's functioning in almost every area -- seeing, hearing, smelling, feeling, memory, imagination, productive thinking, and so on.

Observers who are pessimistic about the capacity of colleges and universities to change say that all of the rebellion and unrest on campuses will rapidly "blow over" and that everything will settle back down into the same medieval ruts. In my opinion, too many forces of change have been at work and creativity research can provide useful information and procedures for coping with the existing "mess." I shall try to interpret what I see as some of the most powerful forces of change and the role that creativity research can play.

Changes in Education at Lower Levels

In 1965, I told a national meeting of College Orientation Directors that their task was being changed by the fact that an increasingly larger proportion of students were entering college with a readiness for research and original investigation only to find that their professors had no such expectations of them. I

pointed to a number of projects (Jablonski, 1964; Taylor and Williams, 1966) which had demonstrated that high school students are able to make useful discoveries and pursue successfully independent investigations.

I posed an ethical problem to the Orientation Directors: Should they orient entering freshmen to this kind of further intellectual development, if the college program does not provide opportunities for this further intellectual development and does not reward such development. I suggested that instead they might have to give the kind of orientation suggested by a kind of fable written by a fifth-grade boy in one of my creative writing experiments about "Jonathan, the Flying Monkey." This story is as follows:

> "Once there was a monkey named Jonathan. He lived in the jungle with all the other monkeys. One day Jonathan was flying around having a good time when he spied a tornado that was headed for the monkey camp. Jonathan started to hurry down to one of the other monkeys, but suddenly he stopped. He knew the other monkeys would ask him how he knew a tornado was coming. If he told them he saw it when he was flying they wouldn't believe him and they would all be killed. So Jonathan landed. He picked up a coconut and threw it at a gorilla. The gorilla started chasing him. As Jonathan ran, he yelled for help. Of course the rest of the monkey colony followed and ran after the gorilla and tried to keep him from hurting Jonathan. Since Jonathan ran away from where the tornado hit, all the monkeys were saved."

One might wonder how much of the commotion on college campuses is a reenactment of the drama of Jonathan, the coconut, and the gorilla.

Hastily, let me complete this picture -- and much has happened since 1965. Creativity research has had an increasingly greater impact on pre-primary and elementary education (Torrance, 1969a). Pre-primary programs of educational stimulation that have been successful in teaching disadvantaged children to read have generally used creative approaches. Out of their experiences, young children tell their own stories (Ashton-Warner, 1963; Pines, 1966). Teachers, teacher-aides, or parent volunteers record their stories and the children read and illustrate them. From the very beginning of their school experience, many children are being taught the skills of creative problem-solving and given opportunities to practice these skills.

Reading programs extending from kindergarten through sixth grade are now being introduced which deliberately have built into them a variety of features to facilitate creative development, to encourage practice in creative skills, and to motivate continued learning in exciting ways. Science, mathematics, and social studies programs already have such features built into them from pre-school through the high school years. A movement in the direction of more creative ways of teaching art has been underway for several years. There are promising beginnings in such a direction in music, human relations, and other areas.

An encouraging thing is that these trends in elementary and secondary education are not confined to the United States or to any particular section of the United States. A current review of educational trends in the Arab world (Antar, 1969) reports that "unlike past students, committed to studying by rote, young people today are turning to imaginative library work and creative study" (p. 19). Arab children are now expressing themselves in exuberant form and color, though student art had long been neglected, even discouraged. My correspondence with educators in Japan, Czekoslovakia, India, Germany, France, and other countries indicate that similar changes are occurring throughout the world. Such developments at lower levels of education are bound to have an impact upon higher education.

Pressures among College Students

Dissatisfaction and unrest among college students concerning the lack of creative outlets is not new but has perhaps been building up throughout the 1960's. For example, inspired by a 1961 Look magazine report (Brossard, 1961) of some of the early creativity research, an undergraduate magazine of student conviction was founded. In an initial survey (Moderator, 1962) among college students, the editors of this magazine asked, "Is the creative mind incompatible with the academic environment?" They found a high degree of agreement among students throughout higher education that more attention should be given to creative kinds of achievement. They agreed, however, that there was not much chance that a change in

emphasis could take place within the organized structure of higher education. If it was to take place, these students in 1961 were convinced that it must be initiated and executed by students. They were convinced that creativity among students could flower outside of classrooms, lecture halls, laboratories, and examination rooms. The years since 1961 have of course seen increasing expressions of discontent among college students about the irrelevant and medieval type of education provided in their institutions of higher education. For example, the following are examples of the sixty questions one college student (Vozick, 1967) in Moderator magazine suggested that other college students ask about their institutions:

> What about the things you want to learn and can't?
>
> Can students decide how to learn together? Are students encouraged to teach each other?
>
> How about faculty and students learning something together?
>
> Do your courses deal with real questions, real needs, relevancies, not disciplinary boxes?

Seldom have questions been asked about what happens to creatively gifted students in higher education. I have built up a rather clear picture about what happens from the letters I have received from such students during the past ten years (1968). I realize, nonetheless, that this picture is likely to be biased. Let us turn to some more objective studies.

One such study has been reported by Heist (1968). He and his associates at the University of California at Berkeley identified

highly creative and relatively noncreative students on the basis of personality test data in seven quite dissimilar colleges. As shown in Table 1, he found that the proportions of identified creatives

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Insert Table 1 about here

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who withdrew from college ranged from approximately 50 percent to 80 percent. In five out of seven of the colleges included in the study, a significantly higher percentage of the creative students on each campus left than did the students not identified as creative. Heist concluded from this study that the students who are ranked as creative or identified by measured characteristics of creativity leave some colleges more frequently than others and more frequently than all other students not so identified.

Other studies conducted by Heist and his associates (1968) help to explain why creative students drop out of college more frequently than their less creative counterparts. A rather obvious reason for this is that they are not rewarded for the kinds of achievement in which they excel and for which they are motivated. This is reflected in the results of a study by Bentley (1966) under my direction. This study involved two types of predictors and several different criteria of achievement in a rather traditional course in Educational Psychology. One predictor was the score achieved on the Miller Analogies Test (MAT), a test required as a part of a battery required for admission to candidacy for the master's degree. The other was a composite score derived from a battery of creative thinking tests (Torrance Tests of Creative Thinking, 1966). Both the verbal

Table 1

DROPOUT RATES OF CREATIVE AND NONCREATIVE STUDENTS IN SEVEN COLLEGES

College	% Creatives Dropped Out	% Noncreatives Dropped Out
A	72	51*
B	67	58
C	53	28*
D	51	48
N	53	28*
R	73	47
Z	64	36*

* Indicates differences in proportions are significant at .05 level or better.

and figural batteries were given and each task was scored for fluency, flexibility, originality, and elaboration.

Four types of examinations were given in the course. One was a rather traditional multiple choice test requiring recognition of a correct answer. The second was a completion and short answer test requiring recall or memory. The third was a test of creative applications requiring divergent thinking using the information acquired in the course. The fourth was a decision-making test requiring evaluation and judgment, making decisions about relevant problems and supporting the decision with criteria developed in the course.

In this class of 110 students, as shown in Table 2. we obtained

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Insert Table 2 about here

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quite different patterns of correlation for the two predictors with the four criteria. Quite clearly, the highly creative students were best able to demonstrate their achievement on the test involving creative applications while those scoring highest on the Miller Analogies Test excelled on the multiple-choice test. It is easy to see that as one changes the kind of test a new set of star achievers emerges.

A study by Whitaker (1967) also suggests what is happening to creative students in their relationship to higher education. It is a study of 151 of Berkeley's underground subculture. These young people are of college age and live in the University community but are not enrolled in the University. Whitaker compared these students

Table 2

PREDICTION OF DIFFERENT KINDS OF ACHIEVEMENT BY TORRANCE TESTS OF CREATIVITY AND MILLER ANALOGIES TEST

Kinds of Achievement	Coeff. of Correlation TTCT	MAT
Cognitive	.03	.47
Memory	.11	.41
Creat. Applications	.53	.37
Evaluative Think.	.34	.36
New Idea Project	.25	.19
Total Achievement	.34	.36
		N=75

with students who were enrolled. These young people expressed a disdain for formal education but were attracted to the University environment as a source of cultural stimulation and asylum. Compared with the students, these young people were more unconventional in appearance and described themselves as more untidy, free, eccentric, and imaginative. Their vocational choices tended to be in the creative arts. Their measured intelligence was almost identical to that of the students. On the Allport-Vernon-Lindzey Scale of Values, their highest patterns were Esthetic and Theoretical, as MacKinnon and his associates (1961) found for outstanding creative people in both the arts and sciences. Their highest measured needs were for autonomy, change, exhibitionism, and succorance and their lowest were for order, endurance, defendance, achievement, and dominance. These apparently creative young people had given up hope that established education could meet their needs, yet they sought the university environment, operating on the fringes outside the classroom.

Let us examine now some of the major controversies fomented by creativity research.

College Admission, Fellowships, Scholarships

Some creativity researchers believe that creative achievements during the high school years and performance on tests of creative thinking ability should be considered in awarding of fellowships and scholarships. College admission personnel and scholarship granting agencies, however, have steadfastly maintained that the cognitive-memory type tests now in use are satisfactory and have

turned a deaf ear to arguments for such reform. Astin (1969), criticizing what he calls "the folklore of selectivity" in colleges, has suggested an analogy between educational institutions and handicappers in horse racing. He charges that they have been interested in predicting performance rather than in trying to improve his performance (make him run better and faster). He believes that educational institutions should act more like jockeys and trainers (i.e. improve the performance of the individual, not just identify those with the greatest potential).

Since it takes time and support to complete long-range predictive studies, creativity researchers have been slow to provide data concerning the predictive validity of creative achievements in high school or tests of creativity. I have only recently reported my first such study, one in which high school seniors at the University of Minnesota High School were tested in the fall of 1959. Seven years after high school graduation, follow-up data were obtained from 46 of the 69 students originally tested. Although some of them were in Viet Nam and many of them were just completing their doctoral programs, their creative achievements were considerable. Twenty of the 23 High Originals were in graduate programs and most of them were in the process of completing their doctoral dissertations at top flight Universities in the United States and Europe. None of the 23 Low Originals indicated that they had reached the dissertation writing stage and only five of them were in graduate programs. The following

creative achievements differentiated the High Originals from the Low Originals: number of poems, stories, plays, songs, etc. written; number of such works published; number of books written; number of radio or television scripts and productions; number of original research designs developed; number of original suggestions for changes in their work situations; number who received research grants; and number of scientific papers published. Descriptions of their highest creative achievements and their life aspirations were rated by a panel of experts on the basis of creativity criteria and these ratings differentiated the two groups quite sharply. The correlation data are presented in Table 3. It will be noted that only one of the nine coefficients of

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Insert Table 3 about here

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correlation for the non-creativity variables is statistically significant at the .01 level, while nine of the twelve creativity predictors reach this level of significance. If we lower the level of significance to the .05 level, two of the coefficients for the non-creativity predictors and eleven of the ones for the creativity predictors are significant.

Creative Positives of Disadvantaged Groups

Black students and members of other minority groups have demonstrated to reinforce their demands that the kinds of talents valued by their groups be considered in making scholarship awards to members of their minority groups. Institutions of higher education and award granting agencies, however, have not understood

Table 3

CORRELATIONS BETWEEN PREDICTORS ESTABLISHED IN 1959 AS HIGH SCHOOL SENIORS AND CREATIVE ACHIEVEMENT CRITERIA ESTABLISHED IN 1966

Predictors	Highest Creat. Ach.	Quantity Creat. Ach.	Future Creat. Motiv.
Intelligence Test	.37*	.22	.32
High School Ach.	.20	.09	.15
Peer Nominations: Creativity Criteria	.13	.13	.18
Fluency (TTCT)	.39*	.44*	.34
Flexibility (TTCT)	.48*	.44*	.46*
Originality (TTCT)	.43*	.40*	.42*
Elaboration (TTCT)	.32	.37*	.25
Combined TTCT	.50*	.46*	.51*

* Significant at .01 level. N=46.

these demands and have continued using the criteria valued by the dominant culture.

On the basis of comparative studies involving a variety of disadvantaged groups and intensive creativity workshops, I (Torrance, 1969b) have identified what I call the "creative positives of disadvantaged children and youth." These include: high non-verbal fluency, flexibility, and originality; high verbal fluency and originality in small groups and informal situations; high productivity in small groups; excellence in visual art, creative movement, dance, and other physical activities; richness in imagery; and high motivation to learn in games, music, sports, humor, and with concrete objects.

My argument is that disadvantaged children and youths will learn academic subjects now in the curriculum, if programs are built on these creative positives -- if these youngsters are permitted to use their strengths and achieve success in creative activities. Thus far, I have been unable to find opportunities for applying these ideas in regular school situations. In discussing a proposal to make such an application on an experimental basis in 1970-71, I was told by the curriculum director that the school system was not interested in having these creative positives developed.

Other Issues

Many creativity researchers and college students are insisting that top priority be given to helping students acquire the skills for finding out their own and for solving problems creatively.

College teachers rather generally have continued to insist that top priority be given to the acquisition of information already established and this acquisition has been through authority acceptance rather than through some combination of these with interactive and discovery methods.

Many creativity researchers and college students maintain that current methods of assessing academic achievement involve a process of memorizing and/or recognizing the materials presented in lectures and textbooks and little reflection or imagination. Students seem to respect creative achievement more than this kind of academic achievement. Defenders of the status quo insist that students must first learn mental discipline and acquire the existing information before they can participate in the making of ideas and new things. Members of some dissident groups ("Hippies") criticize creativity researchers for being too achievement oriented.

Conclusion

Regardless of whether higher education pays any attention to the research and development concerning creativity, there is increasing awareness of the strong voice of dissent and protest among students. Under these pressures, it is possible that institutions of higher education will themselves engage in creative problem-solving and in turn will provide means for helping students acquire creative problem-solving skills and they in turn will produce alternative solutions other than violence, destruction, and demonstration.

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